



# Focus on **Mixing Zones for Wastewater Discharges**

from Ecology's Water Quality Program, Program Development Section

## **Issue**

Mixing zones are areas around treated wastewater discharges where the water quality standards may be exceeded. Mixing zone conditions are described in Washington's Water Quality Standards (Chapter 173-201A. WAC). The size of the area is small enough that it doesn't interfere with beneficial uses, such as swimming, drinking and fish habitat. The Department of Ecology (Ecology) allows mixing zones because the concentrations and effects of most pollutants diminish rapidly after discharge, due to dilution. Ecology establishes mixing zones that limit the amount of time the discharge could potentially cause harm to water quality, plants or fish. All states have a mixing zone policy or regulation. Washington's allowance is one of the most restrictive in the nation.

## **General Considerations for Mixing Zones in Washington State**

Washington's Water Quality Standards allow Ecology to authorize mixing zones for wastewater discharges that would otherwise exceed the water quality criteria for aquatic life or human health.

The authorization of a mixing zone is subject to the following conditions:

- The allowable size and location must be established in discharge permits or orders.
- The industry or municipality must fully apply technology-based requirements (all, known, available and reasonable treatment) prior to the authorization of a mixing zone.
- The authorization must consider critical discharge conditions. Critical condition is the time when the physical, chemical and biological characteristics of the receiving water environment interact with the effluent to produce the greatest potential adverse impact on the aquatic biota and existing water uses.
- The authorization must not cause loss of sensitive or important habitat.
- Pollutants must not exceed criteria past the boundary of the mixing zone.
- The mixing zone size and the pollutant concentrations must be minimized.
- A mixing zone cannot create a barrier to the migration or translocation of indigenous organisms or have the potential to cause damage to the ecosystem
- Mixing zone allowances are applicable to standards for the protection of aquatic life and human health.

## **Mixing Zones in Permits**

If any pollutant exceeds or is expected to exceed a water quality criterion after application of technology-based treatment, Ecology may authorize a mixing zone. Ecology typically authorizes a standard sized mixing zone and protects water quality at the edges of the zone. If the water quality is not within criteria, discharge limits are lowered.



## Exceptions for Mixing Zone Size Limitation

The following may be used to allow a larger mixing zone than previously described:

- Ecology approved the engineering report for the discharge before Nov. 24, 1992; or
- Where altering the size configuration would result in greater protection; or
- Where the effluent provides a greater benefit due to flow augmentation than removing it, if removing it is the only option; or
- Where the exceedance is clearly necessary to accommodate important social or economic development.

Before an exception can be made, the company or municipality must demonstrate the following to Ecology:

- All known and reasonable technology (AKART) is applied;
- All other options that are economically achievable are being used;
- Granting the exception would not have the reasonable potential to cause a loss of sensitive or important habitat, substantially interfere with the existing or characteristic uses of the water body, result in damage to the ecosystem, or adversely affect public health; and
- All appropriate best management practices have been applied to manage stormwater.

## Denying or Minimizing Mixing Zones

Ecology may eliminate or deny mixing zones based on environmental factors or technology factors.

Environmental Basis– Ecology may deny a mixing zone if:

- Ecology demonstrates a negative effect on aquatic life or human health due to the allowance of a mixing zone, or
- The receiving water already exceeds the criteria.

Technology Basis– Ecology may deny a mixing zone if:

- Ecology believes a pollutant may be treated or controlled at a reasonable cost such that a mixing zone would no longer be required.

## Current Direction

Within the past couple of years, Ecology was planning to eliminate mixing zones for certain toxic chemicals in Washington's waters. However, due to public comments and an agency-wide plan to reduce, and where possible eliminate some toxic chemicals, Ecology decided to address the issue on an agency wide basis.